

AIWA

SOLID STATE
PORTABLE TAPE RECORDER

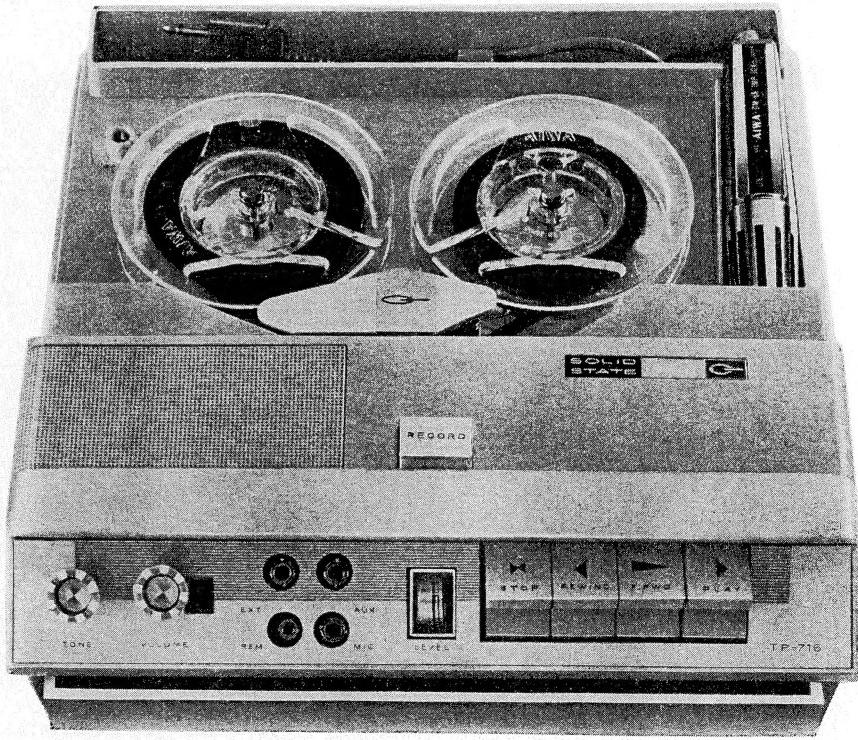
MODEL **TP-716**

[SERVICE MANUAL]



AIWA CO., LTD.

TOKYO JAPAN



SPECIFICATIONS

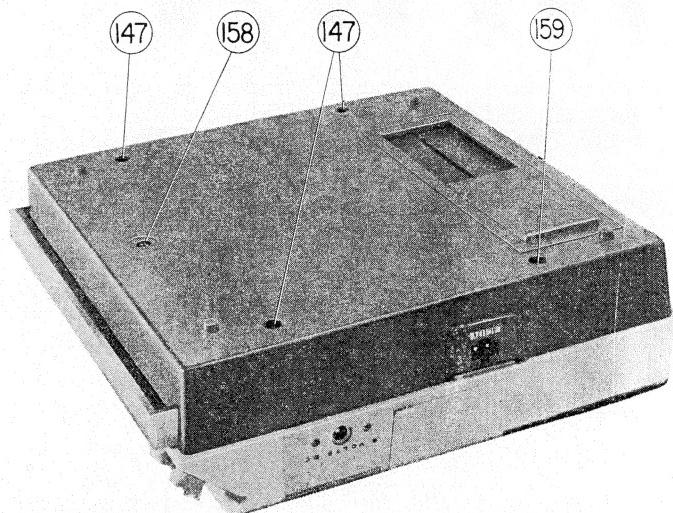
Type:	Capstan drive, dual-track recording & 2-speed system	Tape speed & Recording time:	1-7/8" (4.75cm)/sec. Dual tracks 22min. x 2
Amplifier	12 Semiconductors in total (6 transistors)		3-3/4" (9.5cm)/sec. Dual tracks 11min. x 2
Power source:	DC: Size "C" Eveready No. 1035 or E 93 (Alkaline) 1.5V×4, 6V AC: 110~125V & 220~240V changeable, 50~60 cycles		(w/200 ft. of 1.5 mil tape) Output: Speaker: Dimensions: Weight:
			More than 700mW 2-5/8" (66mm) P.M.D. 9-7/16"×9-1/2"×2-3/4"(240×242×72mm) 5-1/2 lbs. (2.5kg) net w/batteries

AMWA

How to Remove Internal Mechanism from Case

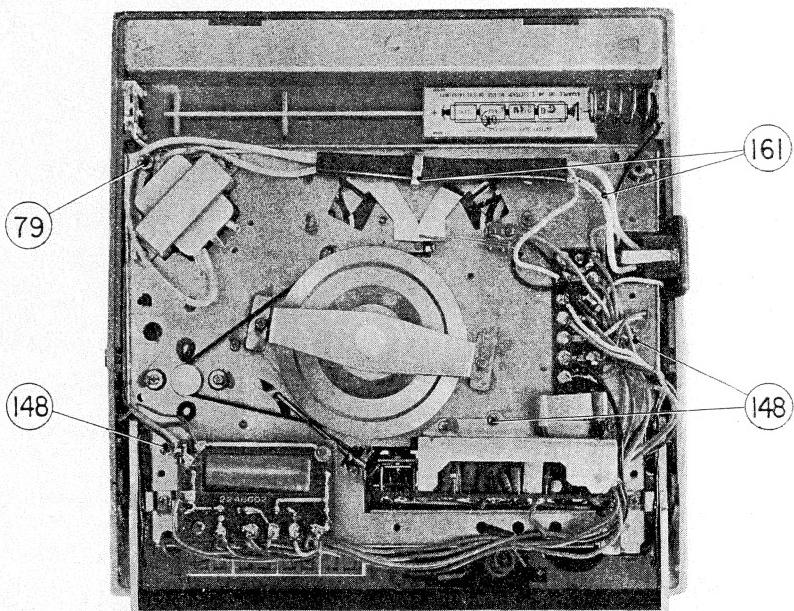
1. Remove back lid

- a. Using a plus (+) screwdriver, remove 5 setscrews securing the lid in place.
- b. Move AC jack out of groove.



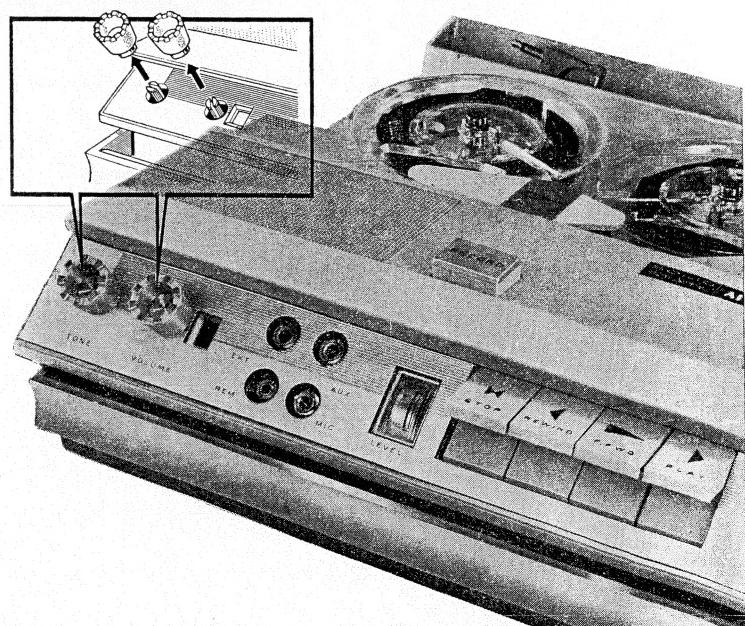
2. Take out chassis assembly from case proper

- a. Using a plus (+) screwdriver, remove 4 screws securing the chassis assembly in place.
- b. Also loosen the chassis supporter by means of a 6ϕ box screwdriver.
- c. Unsolder lead wires from battery terminal plates by means of a soldering iron.

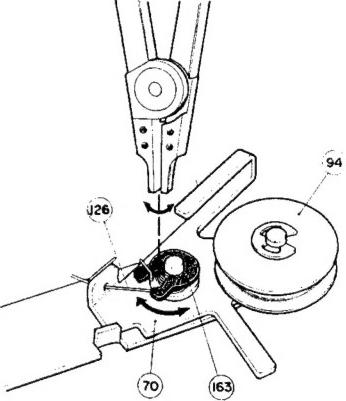
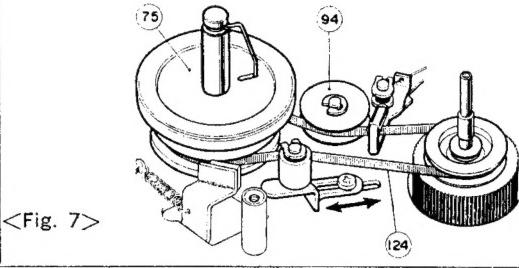
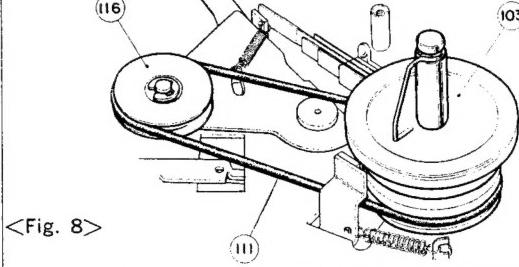
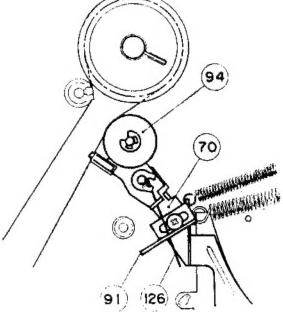
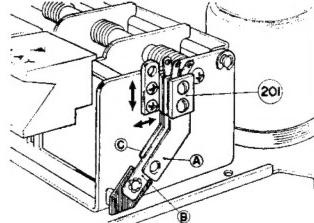
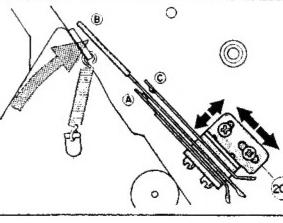


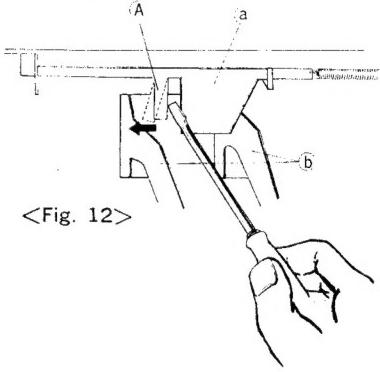
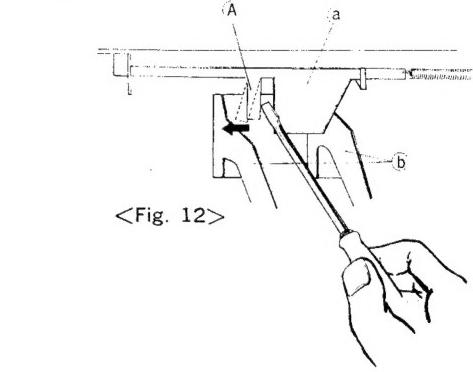
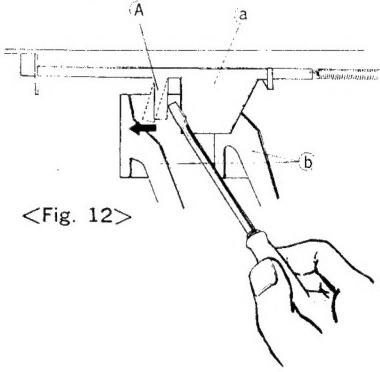
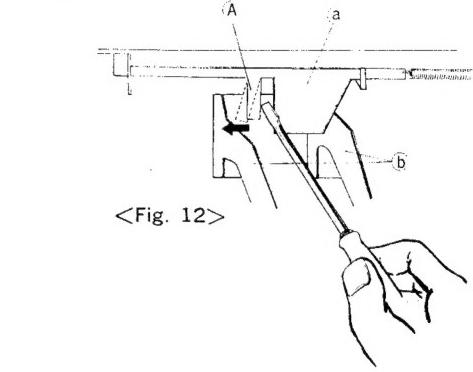
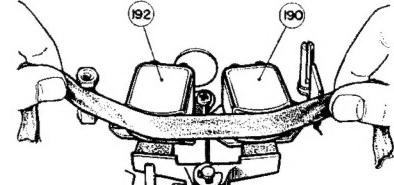
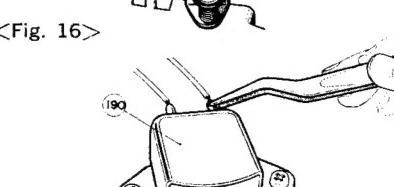
- d. Pull off Volume and Tone Control knobs from the case.

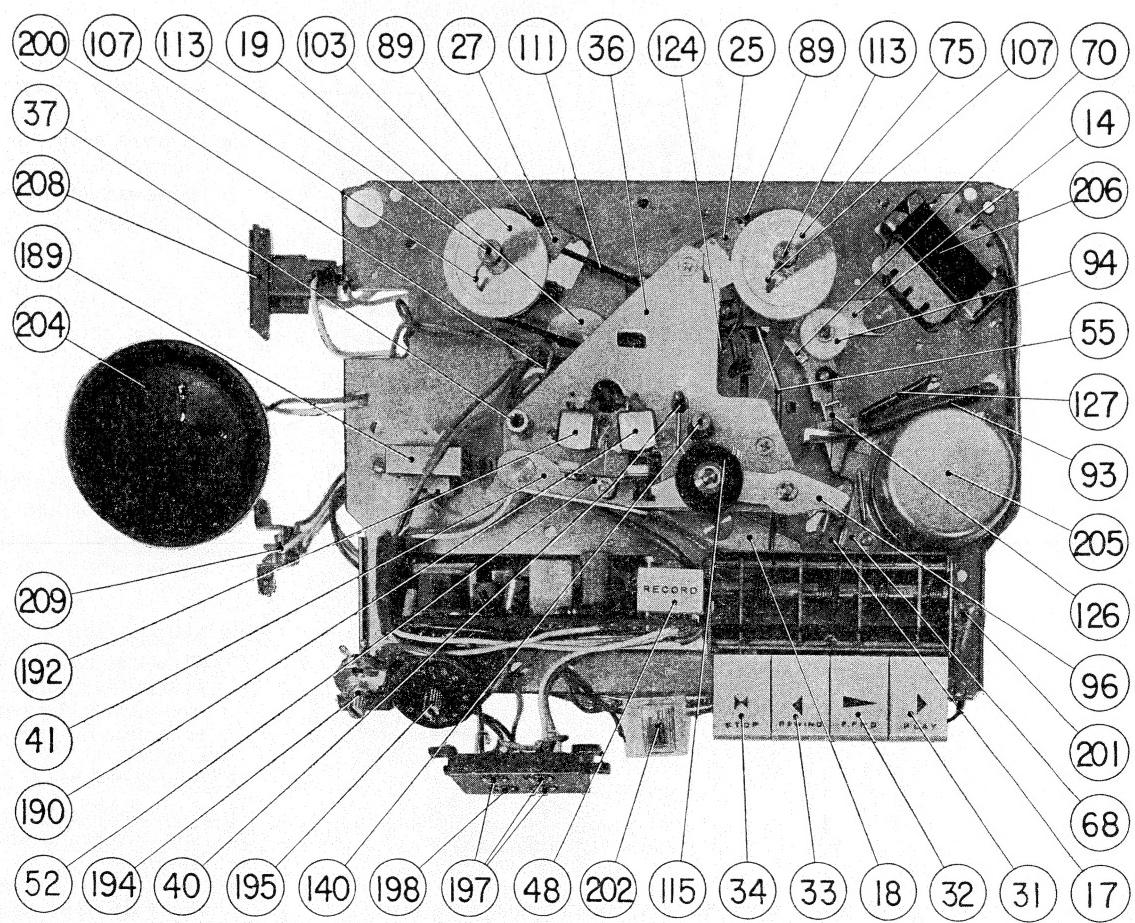
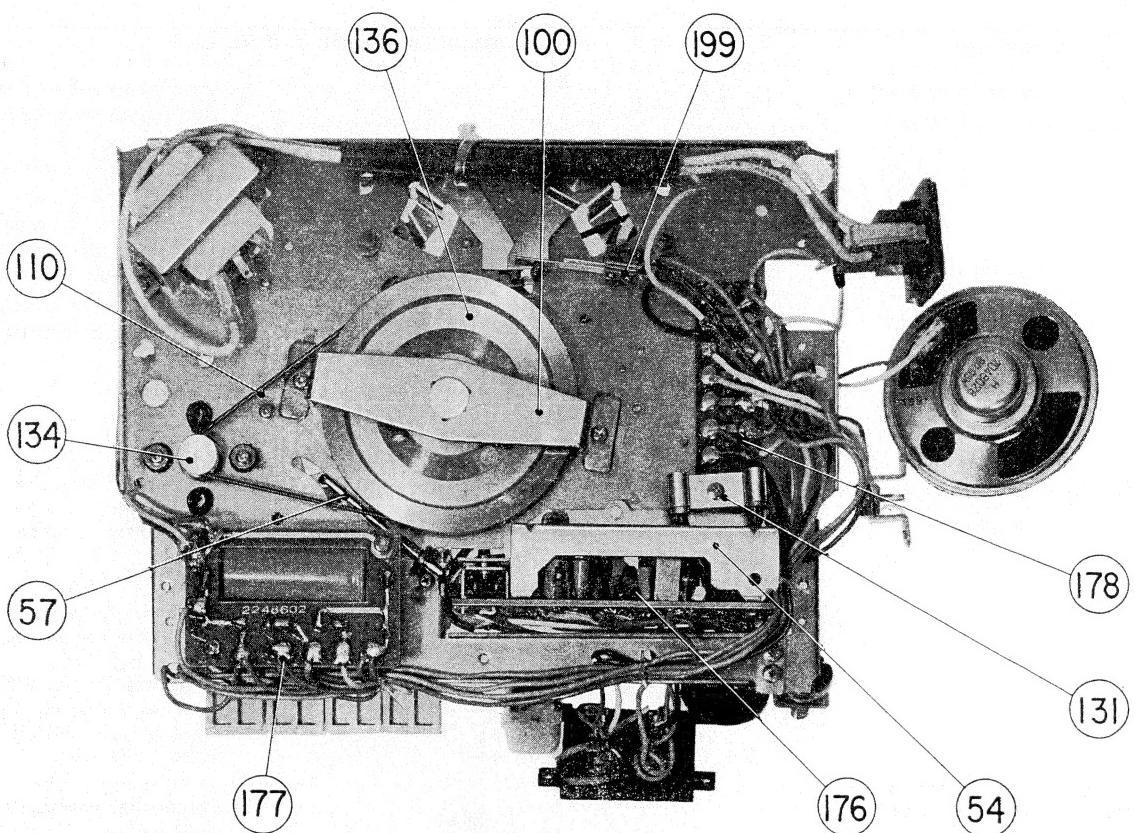
Follow the above disassembly instructions and the chassis assembly will be removed from the case proper.

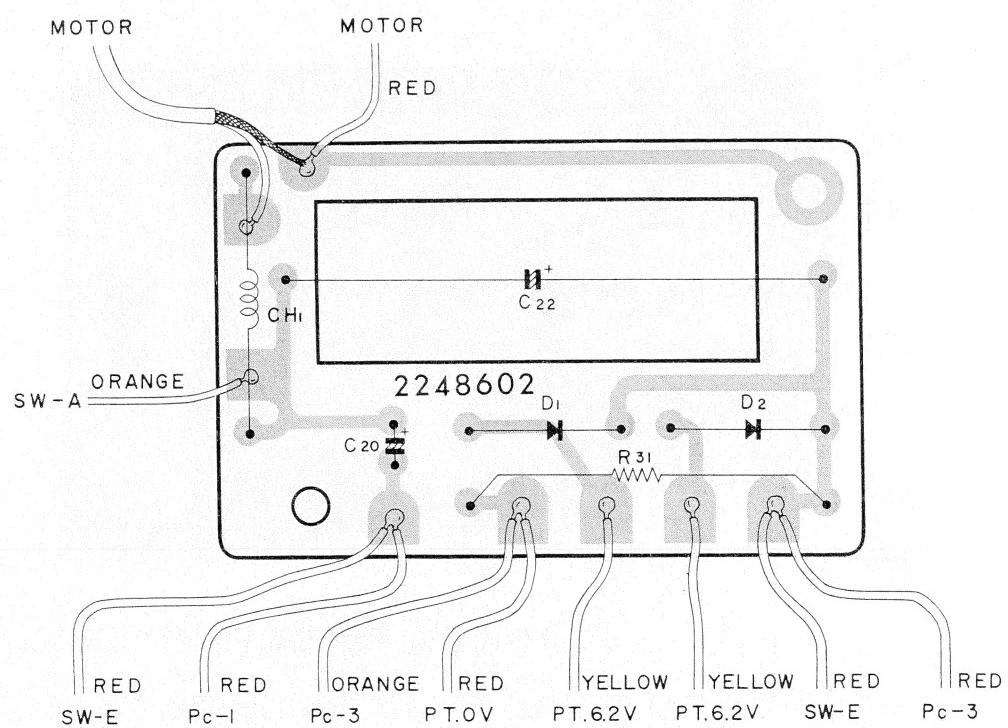
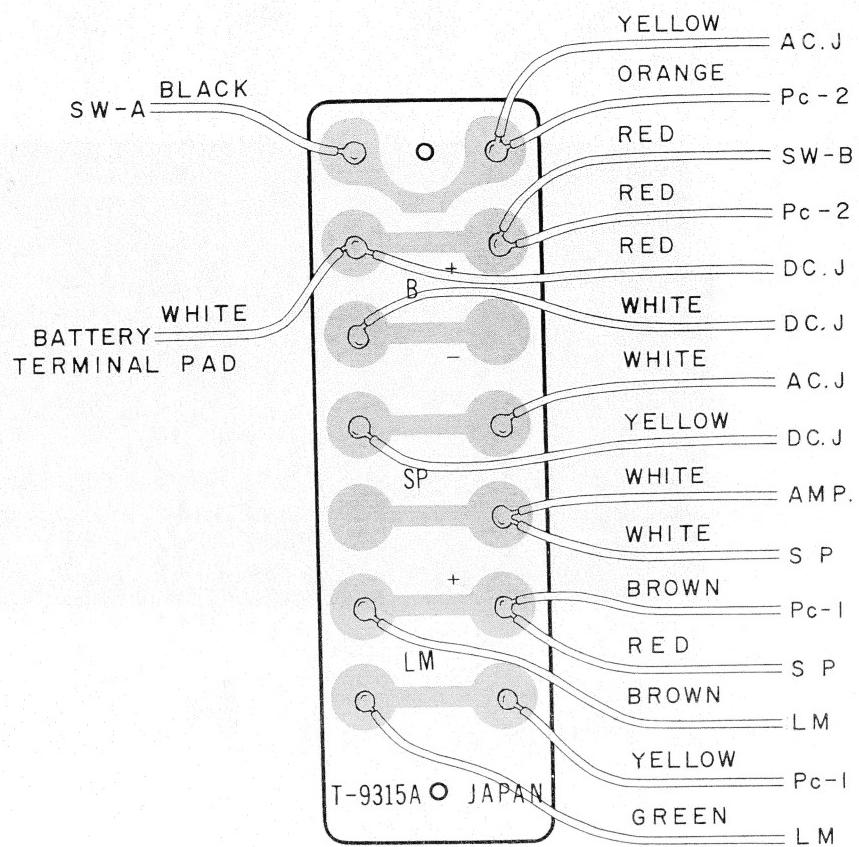


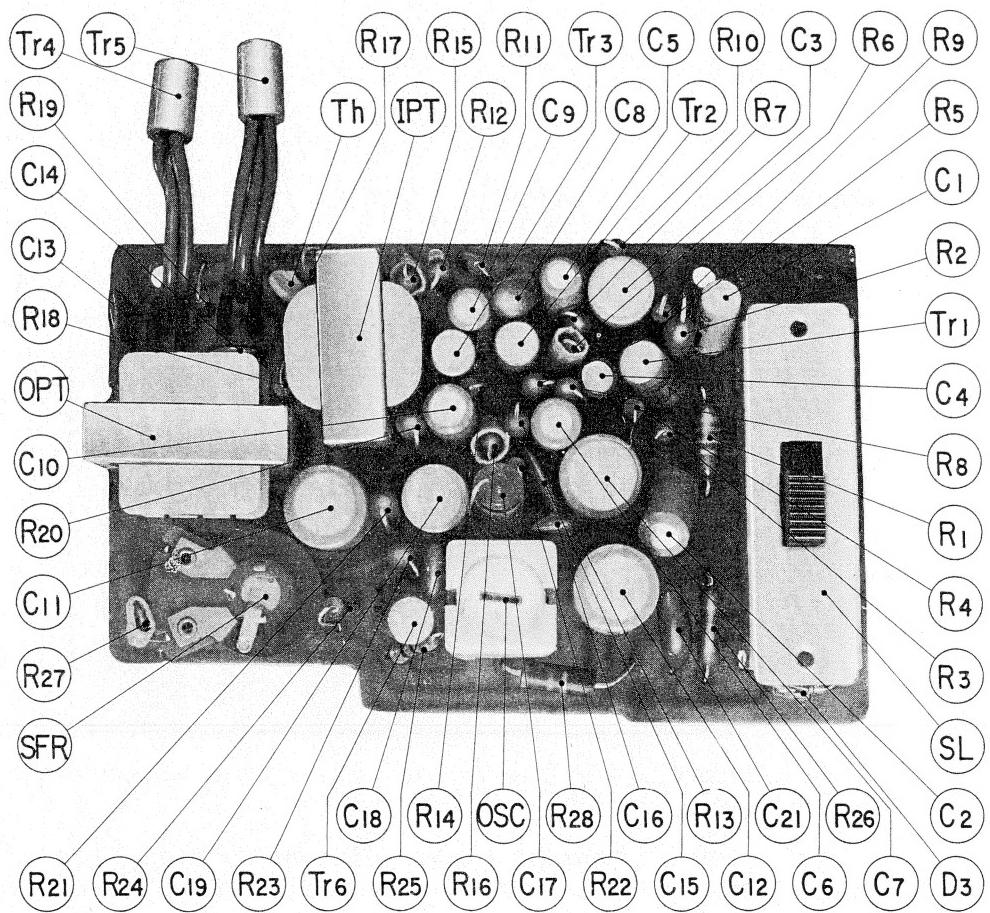
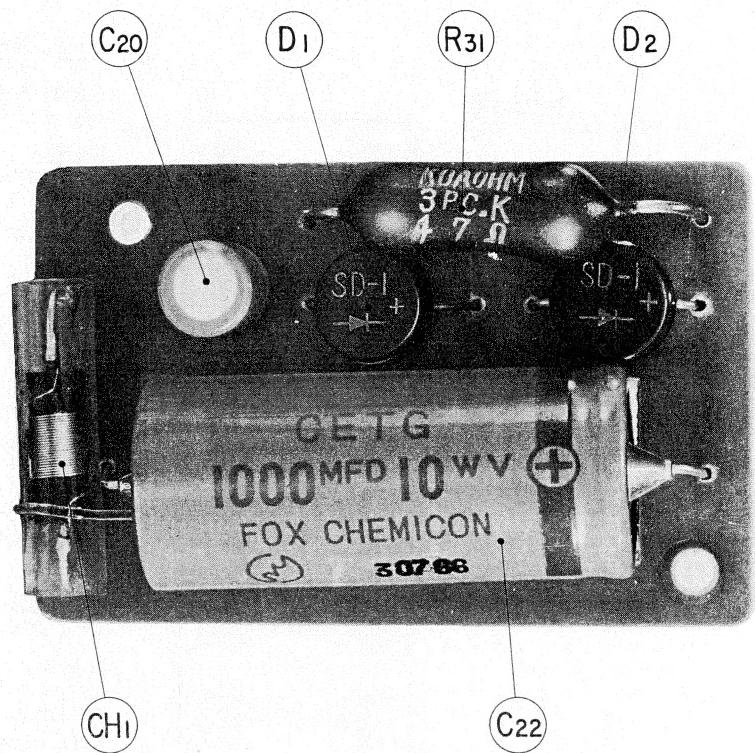
SYMPTOM	POSSIBLE CAUSE & REMEDY
Operates on AC but not on batteries (DC)	<p><Fig. 1></p> <p>LEVEL</p> <p><Fig. 2></p> <p>1. Weakened or dead batteries: Press PLAY button and check battery level with Level Meter. (Fig. 1.) Replace batteries if so indicated by Level Meter.</p> <p>2. Defective soldering or contact of battery terminal plate. Re-solder the plate sufficiently.</p> <p>3. Defective contact of AC jack: (A) and (B) come in contact with each other when AC plug is inserted while (B) and (C) come in contact with each other when pulled off. Should (B) and (C) fail to come in contact with each other when the plug is pulled off, the machine will not operate on battery power. Bend the terminals, (B) and (C), so that they may come in contact with each other as above, or polish the contacts. (Fig. 2)</p>
Operates on neither AC nor battery power	<p><Fig. 3></p> <p><Fig. 4></p> <p><Fig. 5></p> <p>1. Defective contact of Remote jack: Remote jack is found in the front panel of the case and marked REMOTE. If the contact indicated by the small arrow mark (Fig. 3) is defective, the machine (recorder) will not operate. Bend the terminal, (A) in the direction indicated by the arrow mark (↔), Fig. 3.</p> <p>2. Defective contact of leaf switch A: If (A) and (B) fail to come in contact with each other in F.FWD or RWD position, adjust the two screws by means of a plus (+) screwdriver so that (A) and (B) may come in contact with each other in the above position. (Fig. 4).</p> <p>3. Rubber belt out of place. Mount the belt in proper place. (Fig. 5)</p>

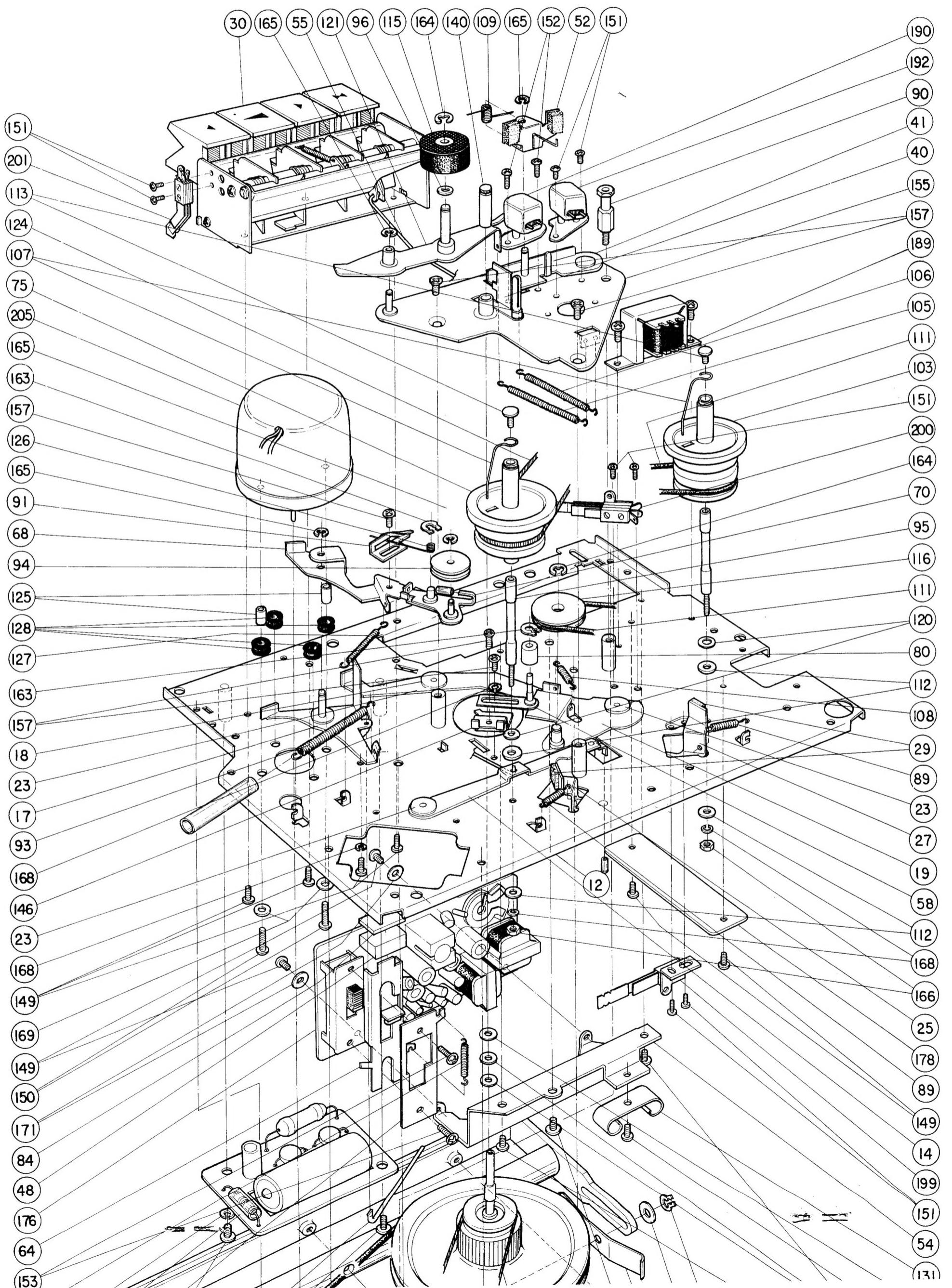
SYMPTOM	POSSIBLE CAUSE & REMEDY
In PLAY, it forwards tape but fails to take up tape	<p>1.  Fig. 6</p> <p>2.  Fig. 7</p>
Fails to rewind	<p> Fig. 8</p> <p>② Rewinding belt slipping out of rewinding roller: ⑦ As shown by Fig. 8, mount the belt on to the lower groove.</p>
In F.FWD, tape winding slows down in speed or completely stops as it approaches the final stage	<p> Fig. 9</p> <p>② Insufficient torque ; tension spring is not in contact with spring adjusting plate or contact pressure between the two is weak. ⑦ Move the spring adjusting plate left or right (\leftrightarrow) by means of a plus (+) screwdriver and adjust it so that the tension spring may come in contact with "window" of the spring adjusting plate during F.FWD operation. However ,it should not come in contact with the "window" when Play button is pressed. (Fig. 9)</p>
Noise heard from speaker during F.FWD operation	<p> Fig. 10</p> <p>② Defective contact of leaf switch E: In F.FWD, ④ and ⑤ should be in contact with each other while ⑥ and ⑦ be separated from each other. ④ and ⑤ remaining in contact with each other in F.FWD cause noise. ⑦ Using a plus (+) screwdriver, loosen the two screws indicated in Fig. 10, move them leftward, backward, forward or rightward as necessary and adjust the contact. (Fig. 10).</p>
Noise heard from speaker during RWD operation	<p> Fig. 11</p> <p>② Defective contact of leaf switch B: In RWD, ⑧ and ⑨ should come in contact with each other and ⑩ and ⑪ separated from each other. ⑧ and ⑨ remaining in contact during RWD operation cause noise. ⑦ Loosen the two screws indicated in Fig. 11, and adjust them in order to correct the defective contact of the switch B. (Fig. 11).</p>

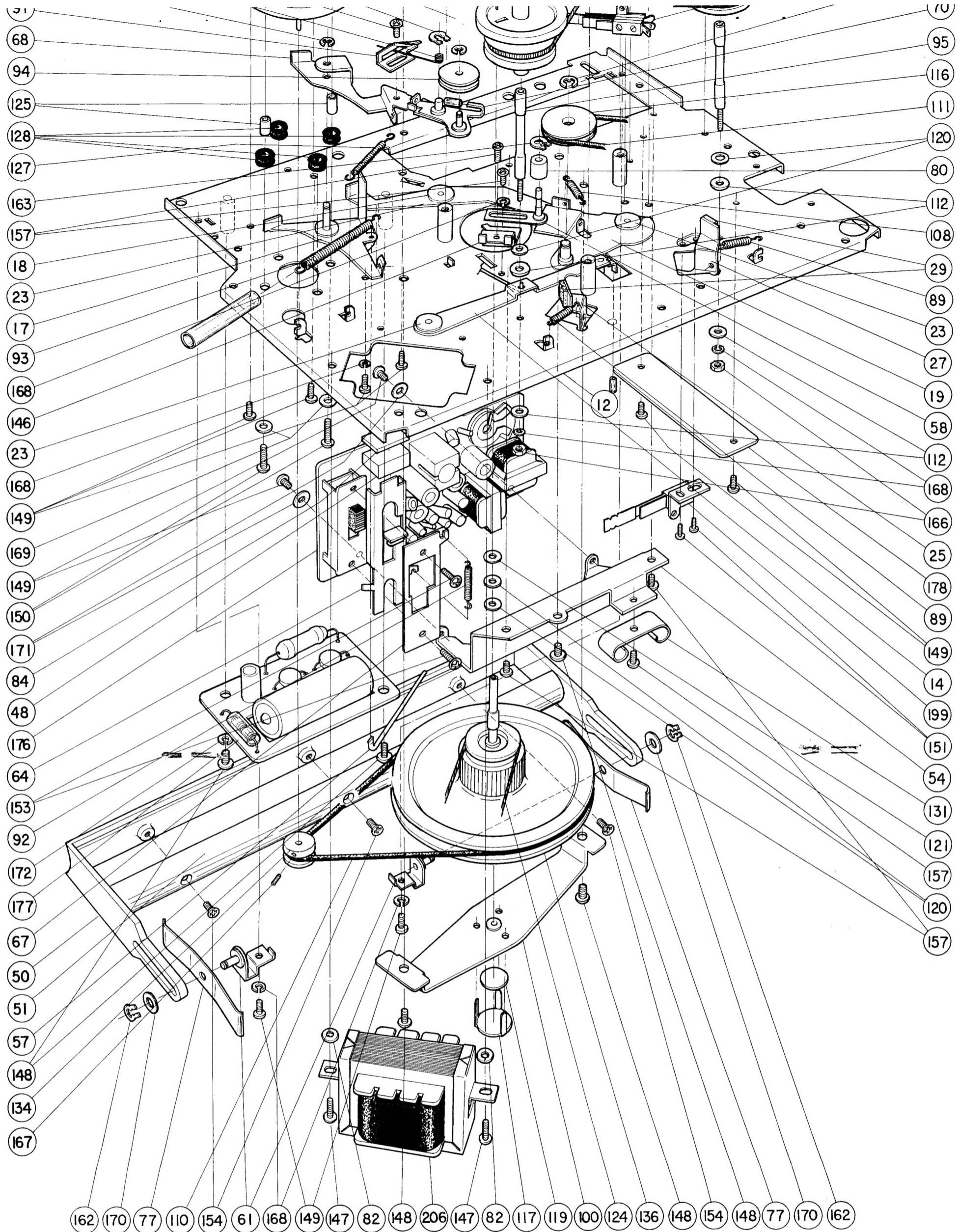
SYMPTOM	POSSIBLE CAUSE & REMEDY
Permits change of operation to PLAY directly from F.FWD	 <p><Fig. 12></p> <p>Ⓐ Maladjustment of push switch : This means that contact pressure between kick lever and slide plate is insufficient even with F.FWD button pressed and then PLAY button pressed consecutively.</p> <p>Ⓑ As shown by Fig. 12, bend the part A in the direction indicated by the arrow mark to give the sufficient contact pressure.</p>
No revolution in low tape speed 1-7/8 ips. (4.75cm/sec.)	 <p><Fig. 13></p> <ol style="list-style-type: none"> Ⓐ Insufficient contact pressure of pinch-roller : Pinch-roller stained with oil or grease. Ⓑ Wipe it clean. Ⓑ When set to low tape speed, there must be a gap at the spot marked (※) in Fig. 13. Ⓐ If the gap not existing, adjust the parts as indicated by the arrow mark (↔) so that it may be obtained. (Fig. 13).
Defective recording & playback	 <p><Fig. 14></p> <p>Ⓐ Broken lead wire of recording/playback head. Ⓑ Solder the broken lead wire. (Do not mistake plus side for the minus.)</p>
Insufficient volume	 <p><Fig. 15></p> <ol style="list-style-type: none"> Ⓐ Insufficient contact pressure of head pad: Ⓑ Bend the head pad so that the head pad felt Ⓐ may be sufficiently pressed onto the slit surface Ⓑ of the head. Ⓑ Dirty surface of recording/playback head: Ⓐ Wipe the surface clean with a dry or absolute alcohol-moistened soft piece of cloth, carefully avoiding possible scratch or damage to it. Ⓑ Defective recording/playback head. <ol style="list-style-type: none"> (1) When Play button is depressed, Volume knob turned to the highest level and the head terminal touched by tweezers, noise is heard from speaker. Ⓐ Replace the head. (2) Defective amplifier: Ⓐ Noise not heard when tested as (1) above Ⓑ Detect the trouble by referring to Circuit Diagram.  <p><Fig. 16></p>  <p><Fig. 17></p>

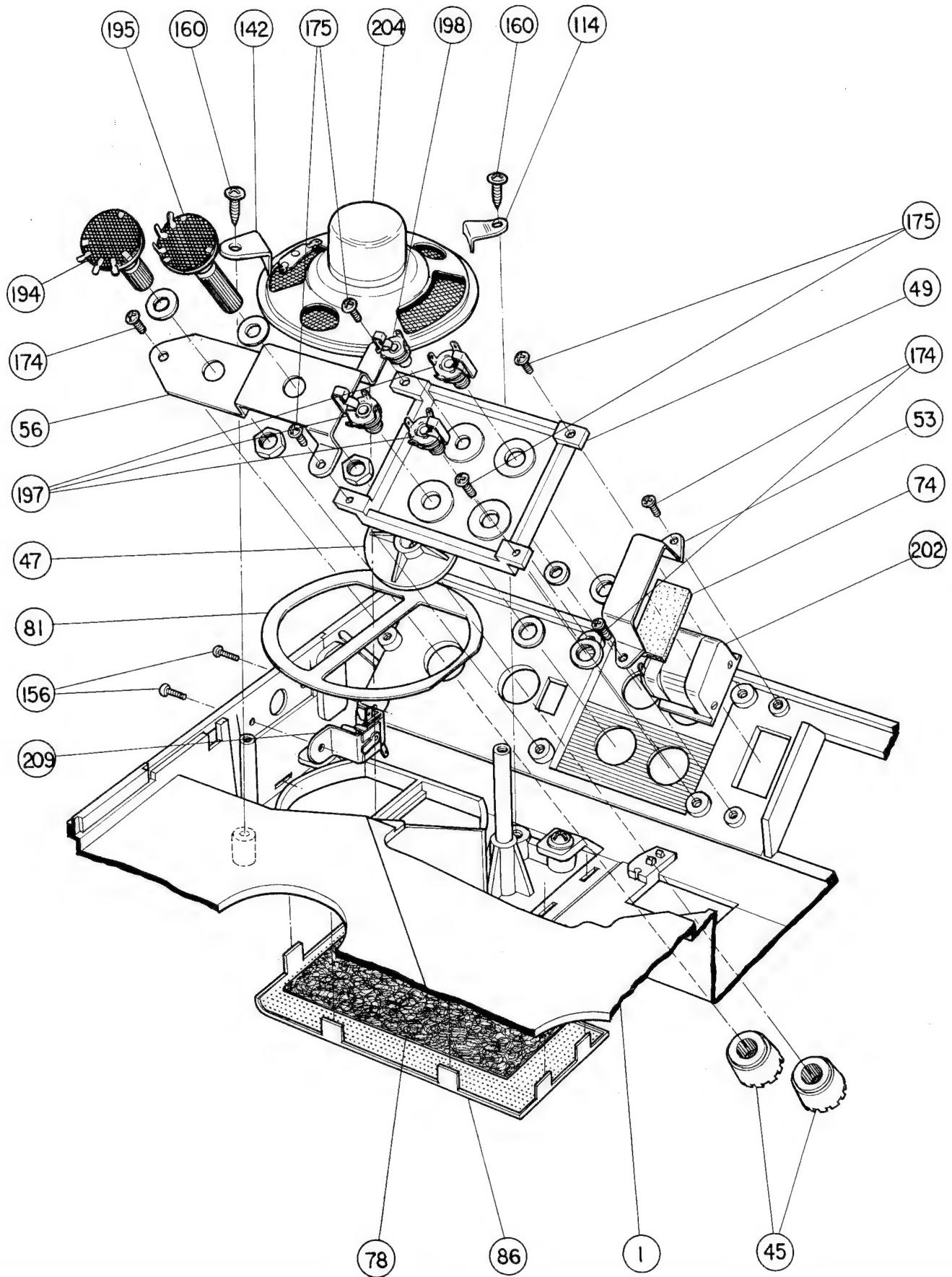


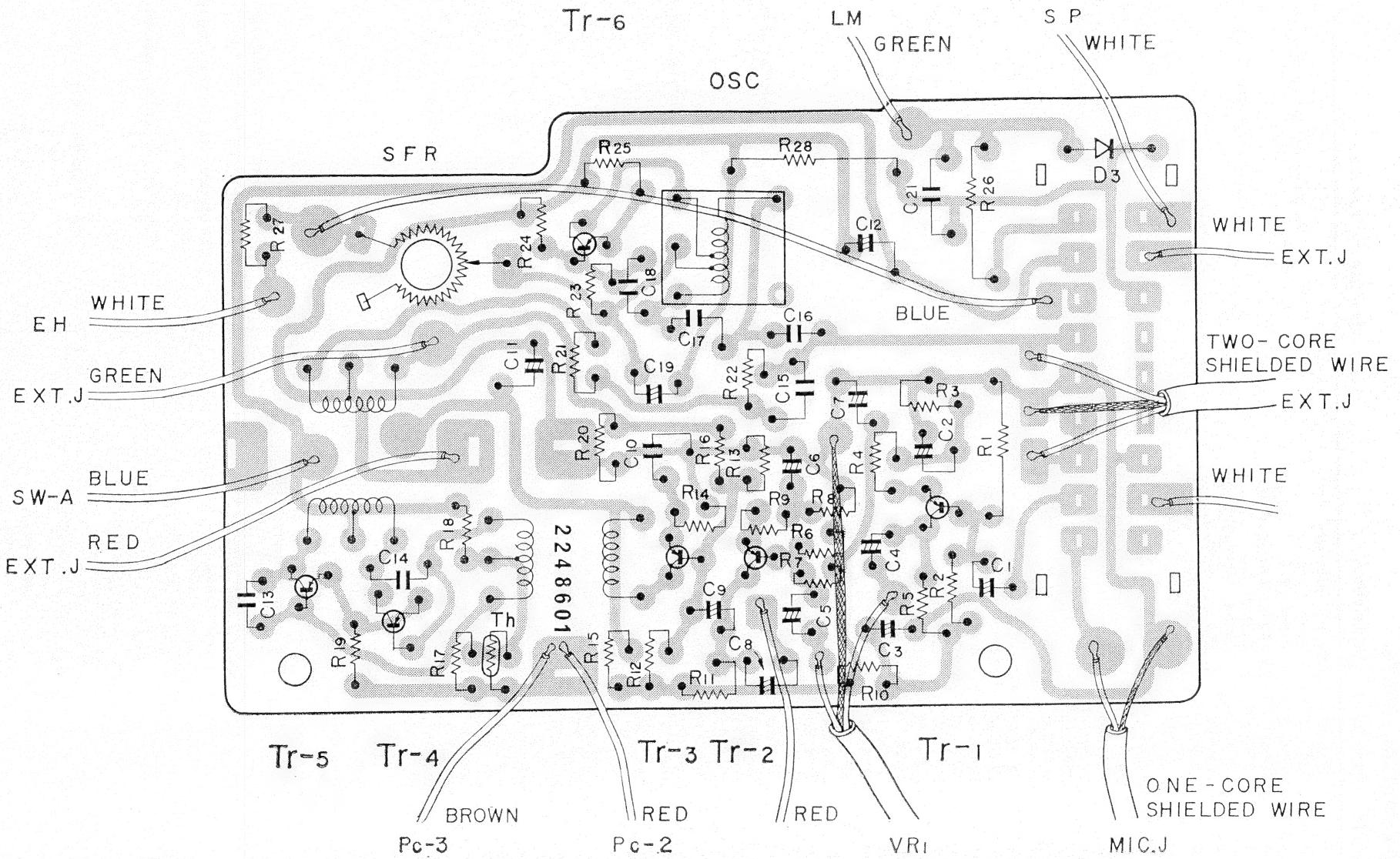












PARTS LIST

MECHANICAL PARTS

Ref. No.	Part No.	Description	Quantity	Remarks
1	2248113	Case proper ass'y	1	
2	2248102	Case proper	1	To make up Case proper ass'y
3	2248114	Front grille	1	"
4	2248095	Bottom lid ass'y, Case	1	
5	2248096	Bottom lid	1	To make up Bottom lid ass'y, Case
6	2248005	Battery room lid frame	1	"
7	2248006	Battery room lid	1	"
8	2248083	Spring, Btry, room lid	2	"
9	2248116	Upper lid ass'y, Case	1	
10	2248117	Upper lid, case	1	To make up Upper lid ass'y, Case
11	2248118	Window	1	"
12	2248093	Mechanism chassis ass'y	1	
13	2248094	Mechanism chassis	1	To make up Mechanism chassis ass'y
14	2248014	Brake lever ass'y	1	"
15	2248015	Brake lever	1	"
16	2248016	Brake shaft	1	"
17	2248003	FWD lever B	1	"
18	2214022	Rewinding lever A	1	"
19	2332096	RWD lever B ass'y	1	"
20	2209115	RWD roller shaft	1	"
21	2209119	Supporter shaft	5	"
22	2332005	Caulking shaft, FWD	1	"
23	2209119	Lever shaft	5	"
24	2332077	Rewinding lever B	1	"
25	2248085	Brake lever ass'y, Right	1	"
26	2248086	Brake lever, Right	1	"
27	2248087	Brake lever, ass'y, Left	1	"
28	2248088	Brake lever Left	1	"
29	2248089	Brake shoe	2	"
30	2248017	Pushbutton ass'y	1	
31	2248018	Pushbutton, PLAY	1	To make up Pushbuffon ass'y
32	2248019	" F.FWD	1	"
33	2248020	" RWD	1	"
34	2248022	" STOP	1	"
35	2248104	Sub-chassis ass'y	1	
36	2248105	Sub-chassis	1	To make up Sub-chassis ass'y
37	2209107	Guide pin	1	"
38	2209108	Flywheel shaft bearing	1	"
39	2209109	Pinch-roller lever shaft	1	"
40	2209150	Guide plate	1	"
41	2209125A	Head pad ass'y	1	"
42	2209125	" " A	1	"
43	2209126	" " shaft	1	"
44	2209151	Caulking shaft	1	"
45	2248030	Volume knob	1	
46	2248031	Head cover	1	
47	2248032	Volume indicator plate	1	
48	2248033	Recording button	1	
49	2248034	Jack holder	1	
50	2248037	Handle proper	1	
51	2248038	" cover	1	
52	2247029	Head pad B ass'y	1	
53	2248039	Meter holder	1	
54	2248042	Amp. chassis	1	
55	2248043	Coupling rod	1	
56	2248112	Volume holder	1	
57	2248045	Recording bar	1	
58	2248106	Belt adjusting lever ass'y	1	
59	2248107	Belt adjusting lever	1	To make up Belt adjusting lever ass'y
60	2248108	Adjusting lever shaft	1	"
61	2248049	Handle attaching ass'y	2	
62	2248050	Metal fitting	2	To make up Handle attaching ass'y
63	2248051	Shaft, Handle	2	"
64	2248090	Recording lever ass'y	1	
65	2248091	Recording lever	1	To make up Recording lever ass'y
66	2248054	Pressure spring, Switch	1	"
67	2248055	Recording guide plate	1	
68	2248056	FWD lever A ass'y	1	
69	2248057	FWD lever A	1	To make up FWD lever A ass'y
70	2248058	Tension arm ass'y	1	"
71	2248059	Tension arm	1	"
72	2209112	" roller shaft	1	"
73	2222041	" arm shaft	1	"
74	2248060	S cushion	1	
75	2248061	Takeup reel platform ass'y	1	

Ref. No.	Part No.	Description	Quantity	Remarks
76	2209104	Core bar, Reel	1	To make up Takeup reel platform ass'y
77	2248062	Handle spring	2	
78	2248063	H cushion (A)	1	
79	2248064	Supporting shaft, Case	1	
80	2248110	Adjusting roller	1	
81	2248066	Baffle board	1	
82	2248067	Collar, Transformer	2	
83	2248068	Name label, Volume knob	2	
84	2248069	" plate, Record knob	1	
85	2248070	" " Head cover	1	
86	2248071	Punching plate	1	
87	2248072	Name plate, Window	1	
88	2248073	Decorative panel	1	
89	2248077	Brake spring	2	
90	7062018	Tape guide	1	
91	2248092	Adjusting board, Speaker	1	
92	2209154	Spring, O3X	1	
93	2214029	" 06A	1	
94	2209170	Tension roller	1	
95	7072004	Reel shaft B	1	
96	2209192	Pinch-roller lever ass'y	1	
97	2209120	Pinch-roller lever	1	To make up Pinch-roller lever ass'y
98	2209128	" shaft	1	"
99	2209181	" boss	1	"
100	2209192	Thrust plate ass'y	1	
101	2209128	Thrust plate	1	To make up Thrust plate ass'y
102	2209129	Wheel bearing	1	"
103	2209176	Supply reel platform ass'y	1	
104	2209134	Core bar, Reel platforom	1	To make up Supply reel platform ass'y
105	2209135	Spring, O3A	1	For Pinch-roller
106	2209136	" O3B,	1	For Head pad
107	2209139	" O3E,	2	For Reel platform
108	2209140	" O3F,	1	For RWD
109	2209155	" O3Y,	1	For Head pad ass'y
110	2209141	Rubber belt 90	1	For Flywheel
111	2209149	" " 60	1	For Rewinding
112	7089027	Shaft ring	4	
113	2209159	Setscrew, Reel	2	
114	2209156	Clamp, Speaker	1	
115	2207137	Pinch-roller	1	
116	2207142	Rewinding pulley	1	
117	2207220	Thrust plate	1	
118	2207205	Pressure pad, Btry terminal	2	
119	2207221	Steel ribbon	1	
120	2209153		4+ α	2 for reel platform & 2 for flywheel adjustment 1 for pinch-roller & 1 for flywheel adjustment
121	2204181	Polyethylene washer	2+ α	
122	2222036	Pressure spring, Btry term.	1	
123	2247036	Clamp, Speaker	1	
124	2209172	Tetron belt	1	
125	2332141	Collar	2	
126	2332094	Tension spring	1	
127	2332064	Spring, FWD lever	1	
128	1301111	Rubber bushing	4	
129	7054005	Name plate, Voltage indicator	1	
130	2247038	H (plastic) cushion (3)	1	For microphone
131	7038004	Radiation plate	1	
132	1280030	Name plate, A	1	
133	1280059	" B	1	
134	2240015	Motor pulley	1	
135	2247032	M (plastic) cushion (1)	1	For microphone
136	2229056	Flywheel ass'y	1	
137	2222045	Flywheel	1	To make up Flywheel ass'y
138	2209206	" shaft	1	"
139	2222039	" pulley	1	"
140	2332198	Capstan collar ass'y	1	"
141	2332199	Capstan collar	1	"
142	2332200	Setscrew, Collar	1	"
143	7038003	Metal fiting, Wiring bind	1	
144	2247045	M (plastic) cushion (2)	1	
145	2247043	Speed indicator plate	1	
146		Adjusting metal fitting	1	
147	7263095	Pan-head screw, V \oplus 3-8S	5	3 for case bottom lid & 2 for transformer mounting

Ref. No.	Part No.	Description	Quantity	Remarks
148	7263093	Pan-head screw, V⊕3-5S	7	3 for chassis case proper, 2 for thrust plate ass'y & 2 for power source chassis
149	7263033	" V⊕2-6	10	3 for push switch, 2 for amp. chassis, 2 for relay chassis, 2 for handle attaching & 1 for FWD lever stopper
150	7263035	" V⊕2.6-10S	2	For motor mounting
151	7263033	" V⊕2-4S	8	2 for leaf switch A, 2 for leaf switch B, 2 for leaf switch E & 2 for erasure head
152	7203035	" V⊕2-6S	2	For recording playback head
153	7253073	Bind screw, V⊕2.6-6S	2	For recording lever mounting
154	7223073	Countersunk screw, round, Q⊕2.6-6S	3	For handle cover mounting
155	7233694	Countersunk screw, iron, Q⊕3-6S	2	For sub-chassis mounting
156	7223035	Countersunk screw, round, P⊕2-6	2	For AC adaptor mounting
157	7253072	Bind screw, U⊕2.6-4S	10	2 for slide switch, 1 for spring adjustment, 2 for choke transformer, 2 for belt adjusting lever, 1 for radiation plate & 2 for amp. chassis
158	7251103	Pan-head screw, V⊕3-25S	1	For case bottom lid
159	7351097	Tapping screw, VT1⊕3-12S	1	"
160	7351095	" VT1⊕3-8S	2	For speaker mounting
161	7351096	" VT1⊕3-10S	2	For chassis case proper
162	7442004	Powerful stop ring, STP-4	2	For handle mounting
163	7442003	" STP-3	2	1 for adjusting roller and 1 for tension spring
164	7441010	E-shaped stop ring, STE-3.2	2	1 for rewinding roller shaft & 1 for pinch-roller shaft
165	7441006	" STE-2.3	4	1 for FWD lever A, 1 for pinch-roller lever shaft, 1 for head pad shaft & 1 for tension roller shaft
166	7391115	Hexagonal nut, N-2.6	2	For reel shaft
167	7373034	⊖ setscrew, ⊖2-5S	1	For motor pulley
168	7422305	Spring washer, WS-2.6-5-0.5	6	2 for reel shaft, 1 for belt adjusting lever, 2 for metal fittings to mount handle & 1 for WFD lever stopper
169	2410411	Flat washer, W-2.6-2.5-0.5	2	For motor mounting
170	7081019	Fibre washer 1, WF-4-10-0.8	2	For handle mounting
171	7081013	" " C, WF-2.6-7.5-0.3	2	For amp. mounting
172	7081017	" " WF3-8-1	2	For power source chassis
173	7410417	Flat washer, W-3-10-0.8	3	For front grille
174	7353073	Tapping screw, VT2⊕2.6-6S	3	2 for level meter mounting & 1 for volume holder
175	7555074	" VT2⊕2.6-8S		For jack holder mounting

ELECTRICAL PARTS

Ref. No.	Symb. No.	Parts No.	Description	Quantity	Remarks
176	Pc-1	2248601	Printed chassis (A)	1	
177	Pc-2	2248602	" (B)	1	
178	Pc-3	2209315	Relay chassis	1	
179	Tr1	8024390	Transistor	1	2SB439
180	Tr2	8020540	"	1	2SB54
181	Tr5,6	8020560	"	2	2SB56
182	Tr4,5	8022630	"	2	2SB263
183	Th	8064270	Thermister	1	19D27
184	D ₃	8051060	Diode, 1N60	1	
185	OPT	7002036	Output transformer	1	100Ω : 8Ω SKΩ
186	IPT	7002037	Input transformer	1	2KΩ : 1K
187	OSC	7007006	Oscillator	1	
188	CH ₁	2209313	Choke coil	1	
189	CH ₂	7003019	"	1	Over 10Ω, 100mH 50mA
190	RPH	2212303	Recording/playback head ass'y	1	
191		7046006	Recording/playback head	1	
192	EH	2209316	Erasure head ass'y	1	
193		7046008	Erasure head	1	
194	VR ₂	7021100	Volume control	1	10KΩ (A)
195	VR ₁	7021105	" "	1	1KΩ (A)
196	SFR	7021070	Semi-fixed resistor	1	500Ω

Ref. No.	Symb. No.	Part No.	Description	Quantity	Remarks
197	MIC.AUC.EXT	7032001	Jack, 3.5φ	3	
198	REM	7032002	" 2.5φ	1	
199	SW-A	7031012	Leaf switch A	1	
200	SW-B	7031013	" " B	1	
201	SW-E	7031024	" " E	1	
202	LM	7040017	Level meter	1	
203	SL	7031077	Slide switch	1	
204	SP	7049039	Speaker	1	66cm 8Ω
205	M	2209195	Motor	1	
206	PT	7004029	Power transformer	1	
207	D _{1,2}	7027005	Silicon diode	2	SD-IY
208	AC,J	7032170	AC jack	1	
209	AC,ADP	7032003	6V jack	1	
210		2248603	Wire kit	1	
211		2248604	Tube kit	1	
212	C ₁₅	8211520	Ceramic capacitor	1	330P±10%, 50WV SL
213	C ₁₆	8214610	" "	1	0.001μF±20%, 50WV YY
214	C _{4,5,9}	8332100	Eletrolytic capacitor	3	1μF 6WV
215	C ₁	8332500	" "	1	5μF 6WV
216	C _{2,6,10}	8331310	" "	3	30μF 3WV
217	C _{19,3}	8333310	" "	2	30μF 10WV
218	C ₂₀	8333510	" "	1	50μF 10WV
219	C _{7,11}	8333120	" "	2	100μF 10WV
220	C ₁₂	8333220	" "	1	200μF 10WV
221	C ₂₂	8433130	" "	1	1000μF 10WV
222	C ₁₇	8619610	Styrol capacitor	1	1000P±20% 125WV
223	C _{13,14}	8727810	Mylar capacitor	2	0,01μF ±20% 50WV
224	C ₁₈	8727830	" "	1	0,022μF ±20% 50WV
225	C ₂₁	8727850	" "	1	0,047μF ±20% 50WV
226	C ₈	7015064	Aluminum solid capacitor	1	0,48μF ±20% 25WV
227	R ₂₈	8122222	Fixed resistor	1	2,2KΩ ±10% 1/8W, Stype
228	R ₃₀	8122104	" "	1	100KΩ "
229	R ₁₇	8131910	" "	1	91KΩ 5% 1/4W, "
230	R ₁₈	8131152	" "	1	1.5FΩ "
231	R ₂₄	8131273	" "	1	27KΩ "
232	R ₁₉	8132229	" "	1	2.2Ω ±10% 1/4W, Stype
233	R ₂₅	8132100	" "	1	10Ω "
234	R ₂₀	8132470	" "	1	47Ω "
235	R ₈	8132101	" "	2	100Ω "
236	R _{4,14}	8132221	" "	2	220Ω "
237	R ₂₇	8132471	" "	1	470Ω "
238	R ₁₀	8132561	" "	1	560Ω "
239	R _{8,15}	8132102	" "	2	1KΩ "
240	R ₃	8132222	" "	1	2.2KΩ "
241	R ₁₁	8132332	" "	1	3.3KΩ "
242	R _{5,6,24}	8132472	" "	3	4.7KΩ "
243	R ₁₃	8132562	" "	1	5.6KΩ "
244	R ₁	8132223	" "	1	2.2KΩ "
245	R ₂₃	8132273	" "	1	27ΩK "
246	R _{7,12}	8132333	" "	2	33KΩ "
247	R _{2,16,21}	8132683	" "	3	68KΩ "
248	R ₂₂	8132224	" "	1	220KΩ "
249	R ₂₈	8144829	" "	1	8.2Ω ±10% 1/2W Solid type
250	R ₃₁	7022011	" "	1	47Ω ±10% 3W P type

ACCESSORIES/PACKAGE LIST

Ref. No.	Part No.	Description	Quantity	Remarks
251	7039310	Recording tape w/ 3" reel	1	
252	7039301	Empty 3" reel	1	
253	7074002	Battery, UM-2 dry cell	4	
254	5265803	Microphone, DM-65	1	
255	7048019	Earphone, ME-59	1	
256	7034008	AC cord	1	
257	7058003	Sack of silica gel	1	
258	2248851	Printed indiv. packing	1	
259	2248852	Indiv. packing cushion A, foam styrol	1	
260	2248853	Internal carton box	1/6	
261	2248854	External carton box	"	
262	7051008	Poly-vinyl pouch, AC cord	1	
263	7051015	Plu-vinyl sack, Recorder proper	1	
264	7057033	Battery indicator label	1	
265	2248901	Instructions booklet	1	
266	7057202	Tag, Voltage selector (3-way)	1	

